FOREST INSECT SITUATION

ON FOREST LANDS OF ALL OWNERSHIPS

Within

Montana, North Idaho and Northeast Washington

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I. Introductory Statement

This report on the forest insect situation in Montana, North Idaho, and Northeast Washington has been compiled by Forest Service, Region One, in collaboration with the Intermountain Forest and Range Experiment Station and Montana State Forester.

The data contained in this report have been obtained from the latest insect surveys and other sources available at date of compilation. All data shown are considered sufficiently reliable for the purpose of the report, including control action planning and cost estimating.

This is not a comprehensive forest insect report. No attempt has been made to cover insects other than those which are currently causing damage of significant economic importance from the standpoint of timber and related forest resources and warranting control action. It is intended to serve as a basis for initiating interagency control action planning and cost estimating for the ensuing year. It should, of course, be understood that intensive, on-the-ground surveys will precede actual control action in each control unit to accurately determine insect populations and locations and to reaffirm the need for control action following the winter period and before any authorized action is actually taken.

Note: Montana State Forester's interests and efforts are necessarily confined to infestations within Montana on state and private lands, and more particularly to the spruce budworm program.

II. SPRUCE BUDWORM

1. History of Infestation

Spruce budworm infestations have been recorded within the region since 1922. Until the advent of the current and most devastating epidemic, these infestations have run their course, some with serious tree mortality. The initial buildup of this latter epidemic, or epidemics, which now extends across Montana and North Idaho from Gardiner, Livingston, and Harlowtown to Winchester and Riggins, was first noted in Douglas-fir stands of mixed ownership at several points in south central Montana between 1945 and 1948. Since 1948 the infested acreage has increased from a few hundred thousand acres to over four and a half million acres. Only in two areas have infestations declined naturally since 1948. These were the Swan River and Upper South Fork of the Flathead River infestations.

Currently, epidemic infestations are active in Douglas-fir stands in and adjacent to the Lewis & Clark, Gallatin, Helena, Deerlodge, Beaverhead, Bitterroot, and Lolo National Forests in Montana and in white fir forests in and adjacent to the Lolo and Nezperce National Forests in northern Idaho. Infestations in a few of these areas show some decline in severity over that of previous years. Areas of most noticeable decline are within the older areas of heavy infestation. The cause of the decline is, as yet, undetermined.

Despite indications of a decline in severity within some of the older infested areas the overall acreage showing noticeable defoliation continues to spread. As a result of the increase and more adequate surveys, the acreage of known infestation, as of October 1, is estimated at 3,544,364 acres, exclusive of 1955 and 1956 spray acreages. See Table II for general infestation areas and acreages.

2. Damages

The most serious damage to date done by the spruce budworm has been the killing or deformation of tree tops and upper branches and the loss of increment for each year of heavy attack. In addition to the immediate tree top damage and increment loss there is the resultant damage from top rot, which will probably occur in many damaged trees, and the reduced increment over a several year recovery period following cessation of attack. Damages due to tree mortality have only recently become serious. The magnitude of the present infestation is such that the damage potential from this source is now high. With a current total infestation of 3,544,364 acres, some of which has been infested for as long as 10 years, heavy mortality is accruing in some areas. Growth loss is accruing in all areas of heavy defoliation.

Damage in the form of tree mortality, inflicted by the spruce budworm, is insidious in character. It is not readily apparent in localized areas. Instead, gradual damage occurs over a very large area and over several

years' time. It is difficult to measure this sort of damage in terms of either acres or dollars. However, based upon knowledge of spruce budworm damage inflicted upon the individual tree, and knowledge of the extent of infestation in acres of forest and percentage of stand, the accrued damages to date, in terms of economic loss, have been determined to be in excess of 35 million dollars. This loss is based on equivalent board feet of loss in tree growth and valued at the current rough-milled lumber rate of $70 per MBF.

Other less tangible, but significant actual and potential, losses besides timber growth include losses caused by subsequent attacks by other insects, fire, and erosion. Losses also occur in forest products, such as Christmas trees, wildlife, and recreation resources.

It is significant to note that the threatened Douglas-fir forests lie astride the Continental Divide at the headwaters of the Columbia and Missouri River basins. This in itself is cause for considerable concern. Also by far the larger part of the terrain involved is naturally best adapted to the production of tree growth and water.

3. Past Control Action

Aerial spraying control action was taken on 368,000 acres in 1955 and 885,000 acres in 1956. The 1955 program included two control units in Montana and one in North Idaho. The 1956 program included five control units in Montana and one in North Idaho. Despite these control programs, which were considered reasonably successful, recent surveys disclose a net acreage of 3,544,364 acres of infestation still uncontrolled.

Thus far, control units, where control action has been taken have run heavy to federal public ownership. Less than 5% of the area sprayed in 1955 was privately owned; less than 15% in 1956.

Solicitation of private landowner cooperation, under the direction of the State Forester, has resulted in participation by about 60% of the private owners involved in the 1955 and 1956 control programs in Montana.

Control program costs in 1955 were $1.10 per acre and in 1956 they were $.90 per acre. The low cost in 1956 was due to an exceedingly low bid price for aerial spraying work. Future control costs will undoubtedly be nearer the 1955 rate.

4. Future Control Needs

There is little doubt but that a large scale control program should be continued until such time as there is definite evidence the budworm infestation is on the way out.

The greatest single problem--that of properly financing the control program--results from the intermingled forest land ownership pattern in the spruce budworm infestation areas. With the high percentage of private ownership involved, and the greater portion of that being in small ownerships, the problem of financing control action is most serious.

Apparently, Congress stands ready to finance control action on federal lands and is willing to finance up to 50% of the cost of control action on state and private lands from federal funds. Raising the other 50% of the cost of control on private lands is an expensive and time consuming problem. As indicated above, under "Past Control Action," only about 60% of the private ownership has paid its 50% of control costs in Montana. Only one large owner was involved in North Idaho and full cooperation was obtained. Since Montana control units sprayed to date have been predominantly public ownership, it has been possible to continue the control program because of the very small acreage involved in the 40% of nonpaying private land compared to total acreage involved. Except for about four possible control units, involving less than 20% of the remaining infestation acreage, it will be impossible under existing federal financing policy to take control action without full private ownership cooperation within remaining infestation areas.

The attached policy statement and administrative control unit classification sets forth the manner in which the state and federal agencies are compelled by circumstances to approach the spruce budworm problem in planning a control action program. Under this policy the Montana State Forester and the Regional Forester, Region One, Forest Service, have set up a proposed control program for 1957 which includes five individual control units containing a total of 814,170 acres of infestation. Individual control unit locations, ownership acreages, and other pertinent information is afforded in Table I.

The estimated cost of spruce budworm control action is $1.00 per acre. Thus the proposed 1957 control program will cost approximately $814,170. This cost estimate includes all phases of control work, including pre- and post-control insect surveys and mortality checks, direct and indirect overhead and supervisory charges, as well as direct project costs. Control action involves the careful delineation and mapping of infestation areas and subsequent aerial spraying thereof with a formulated insecticide containing one pound DDT to one gallon of solvent and fuel oil carrier which is sprayed on the infested area at the rate of one gallon per acre. See Table I for 1957 control units.

Policy Statement for Spruce Budworm Control Program

Cooperation Policy. The Federal Government will pay all control costs on federal lands and will pay up to 50% of the control costs on state and private lands for spruce budworm control work within Montana and North Idaho.

Control Action Program Policy. The control action policy is of necessity divided into three priorities:

Priority 1. The State Forester and Forest Service will attempt to obtain adequate financial cooperation so that control action may be directed at the areas of worst infestation and in the most entomologically sound control units possible, regardless of forest ownership.

Priority 2. If prevented from approaching the overall control program as outlined under priority 1 above due to a lack of adequate financial cooperation, efforts will be directed towards the next best entomologically sound control program possible. This may mean sacrificing some desirable entomological aspects of the program in order to select infestation areas where the required financial cooperation can be obtained.

Priority 3. Failing under priorities 1 and 2 to obtain a desirable insect control program due to inadequate financial cooperation, the State Forester and Forest Service will proceed with an action program designed to protect state and federal resources in the most logical manner possible under the circumstances.

For administrative purposes and to facilitate the immediate control action program, definitions for three classes of control units have been established. The classification given each unit is governed by the amount of private land involved.

Class 1 control units will contain sufficient area to be reasonably entomologically sound and will contain not less than 90% public lands.

Class 2 control units will contain sufficient area to be entomologically sound and will contain from 75 to 89% public ownership. There must be reasonable assurance that the required financial cooperation will be forthcoming on the private ownership before any control action is programmed.

Class 3 control units will contain sufficient area to be entomologically sound units. They will contain more than 25% private ownership. The state and Forest Service will program no control action within any class 3 control unit until such time as there is assurance that the required private financial cooperation will be attained.

TABLE I

Proposed 1957 Spruce Budworm Control Program

Proposed Control Unit	Estimated Acreage by Ownerships			
	Federal	State	Private	Total
Madison (Beaverhead NF)	88,756 80.6%	4,977 4.5%	16,347 14.9%	110,080 100%
Hebgen (Beaverhead NF)	80,571 96.7%	955 1.1%	1,798 2.2%	83,324 100%
Judith (Lewis & Clark NF)	119,000 99.0%		1,000 1.0%	120,000 100%
Mill Creek (Gallatin NF)	194,837 69.0%	2,362 1.0%	82,870 30.0%	280,069 100%
So. Continental (Deerloge NF)	179,103 81.0%	4,100 2.0%	37,494 17.0%	220,697 100%
Totals	662,267 81.4%	12,394 1.5%	139,509 17.1%	814,170 100%

TABLE II

Total Infestation as of October 1, 1956 by General Localities
(All in Montana unless otherwise indicated)

Beaverhead NF (and vicinity)	313,112	Helena NF (and vicinity)	640,000
Bitterroot NF (and vicinity)	284,783	Lewis & Clark NF (and vicinity)	340,615
Deerlodge NF (and vicinity)	602,970	Lolo NF (and vicinity)	143,500
Flathead NF (and vicinity)	2,500	Nezperce-N. Idaho	70,700
Gallatin NF (and vicinity)	788,584	Craig Mountain-N. Idaho	45,000
Blackfoot Protective Association	170,100	Yellowstone Park-Wyoming	142,500
		Regional Total	3,544,364

III. ENGELMANN SPRUCE BEETLE

1. History of Infestation

The spruce beetle epidemic which broke out in 1952 and ravaged spruce timber stands of the western part of the region through 1953 and 1954 still continues its general decline.

After the spruce bark beetle epidemic was discovered in 1952, surveys were initiated to obtain the current volume loss. These data showed a serious epidemic within and adjacent to eight national forests west of the Continental Divide. The severity of the damage caused by this beetle increased in these areas in 1953, but in 1954 there was a decline in the infestation.

Preliminary 1956 survey results indicate a continuing lessening in the severity of the damage. The killing of green trees in 1956 has thus far been somewhat less than in 1955 over most areas surveyed. In a few areas the 1956 damage has equaled that of 1955. Significant declines in the 1956 damage have been noted in some areas in which no control measures have been taken, as well as in areas where control action has been taken. Severe weather this past winter has also contributed to the beetle population decline in some areas.

Scattered blowdowns, which have occurred in the spruce type during the past year, may possibly cause an upsurgence in beetle activities in local areas. The effect of these blowdowns will not be known until next year.

2. Damages

On national forest land alone, the 1956 flight of beetle is expected to add about 115 million board feet of infested spruce to the 2,100 million already killed. It is now estimated that the beetles will kill an additional 75 million board feet of spruce in 1957. Much of this 75 million board feet will be within new compartments and uncontrolled units. See Table III below for losses by years.

TABLE III

Infested Spruce Volume by Flight Years on Eight Forests
(National Forest Ownership Only--MMBF

Year	Up to 1952	1953	1954	1955	1956	1957
Volume	537	770	514	292	*115	*75

*Estimated figures.

On state and private forest land there appears to be a comparable decline in the 1956 damage.

3. Control Action to Date

Logging has been the principal method of controlling the spruce bark beetle. Trap trees have been used as an adjunct to logging. During the 1953-54-55 trap tree program, about 60,000 trees were felled and subsequently logged, burned, or sprayed with insecticide to dispose of the trapped beetles. All but 16,000 of these trees were disposed of by logging. The trap tree program was completed in 1956. However, the control and salvage program is continuing at a high level. Table IV shows the volumes removed by logging from 1952 through 1956.

TABLE IV

Spruce Logged on Eight Epidemic Forest Units
(Million Board Feet)

Ownership	Year 2/	Infested	Salvage 1/ and Dead	Total
NF	1952	75	9	84
All other 3/		20	3	23
Subtotal		95	12	107
NF	1953	115	39	154
All other		49	18	67
Subtotal		164	57	221
NF	1954	194	83	277
All other		50	15	65
Subtotal		244	98	342
NF	1955	189	139	328
All other		40	20	60
Subtotal		229	159	388
NF 4/	1956	92	211	303
All other 4/		22	45	67
Subtotal		114	256	370
NF	1952	665	481	1,146
All other	to	181	101	282
Total	1956	846	582	1,428

1/ Salvage spruce are trees logged within one year after attack and usually contain spruce beetle population when logged.
2/ Production year July 1 to June 30.
3/ Private, state, and other nonnational forest ownerships.
4/ Estimated volumes.

During the period July 1, 1955 to June 30, 1956, the spruce beetle control program for national forest lands alone cost $326,000. A summary follows:

Supervision, planning, reports and records--DR, SO, and RO organizational levels	$135,000
Operational and maintenance surveys. Sales preparation over and above normal sales work	$ 59,000
Designation of infestation areas, spotting infested trees, marking trap trees, and the checking of infested tree felling, treatment and logging	$112,000
Forest Insect Laboratory surveys	$ 20,000
Total	$326,000

In the current (1957) fiscal year the spruce beetle program on national forest land only will require about $200,000 for the same classes of work as indicated above.

4. Future Control Needs

Logging continues to be the most economical method of control. Where the infestation has continued to kill green trees in 1956, logging must be continued at a high rate of production in 1957. Even in areas where the 1956 damage has lessened in severity, the cutting of salvage 1/ spruce should continue at a rapid rate to dispose of as many insects as possible and to utilize the timber before deterioration destroys the greatest values. Therefore, logging for control should of necessity be continued at only a slightly reduced level during fiscal year 1958.

It is estimated that during the period July 1, 1957 to June 30, 1958, it will be necessary to remove 40 million board feet of infested spruce and 160 million board feet of salvage 1/ and dead spruce timber from national forest land alone. A continuation of the logging-for-control sales program demands adequate, accurate insect and volume data. To obtain this information, continuation of maintenance 2/ and operational surveys will be necessary. Supervisory work and planning must also be continued in proportion to the

1/ Salvage spruce are trees logged within one year after attack and usually contain spruce beetle population when logged.
2/ A maintenance survey is a recurrent survey of an area that has been covered by an operational survey or a spruce area that has been classified as endemic by a past detection survey.

overall control program. Following is a detailed estimate of financial needs for control work on national forest lands only for the ensuing year (fiscal year 1958 pest control funds):

Supervision, planning, reports and records--DR, SO, and RO organizational levels	$ 30,000
Operational and maintenace surveys. Sales preparation of infested spruce over and above normal sales work	$ 30,000
Designation of infested areas, spotting, marking, and checking of infested trees for logging	$ 45,000
Forest Insect Laboratory survey (population trend, etc.)	$ 5,000
Contingent for unforeseen revisions in the program	$ 15,000
Total	$125,000

IV. DOUGLAS-FIR BEETLE

1. History of Infestation

Sporadic outbreaks of the Douglas-fir beetle have been commonplace in the Northern Rocky Mountain Region for the past decade or longer. Over large areas losses have run from 5% to 75% of the stand during the past several years. These localized losses are estimated to have equaled from 1% to 2% of the Douglas-fir volume annually over and above increment. The outlook is for continued loss for the next several years.

Surveys indicate a slight decline in green tree attacks this year over recent years in most areas of known beetle activity. A few areas are showing an increase. It is believed that the decline in green tree attacks may be due to a moderate amount of blowdown timber much of which, because of small quantities and inaccessibility, cannot be logged. If this is found to be the situation then it is quite possible an upsurge in beetle attacks may result from the infested blowdown.

2. Damage

Cumulative losses in sawtimber throughout the region are serious. It is estimated that about 8% of the original Douglas-fir sawtimber on six of the hardest hit national forests west of the Continental Divide has been lost in the last six years. This amounts to 558 million board feet.

The Coeur d'Alene and Kootenai National Forests had the most serious Douglas-fir beetle situations in the region. There are areas of infestation scattered throughout these forests where Douglas-fir sawtimber occurs. Other forests are losing a significant volume in scattered individual drainages. On the Nezperce and Clearwater Forests, the current forestwide drain is less than 2% of residual green Douglas-fir volume, but the Pete King and Eldorado compartments have lost millions of board feet.

Serious losses are accumulating in the Douglas-fir stands east of the Continental Divide.

While this report discusses national forest areas and infested timber stands, it should be noted that the Douglas-fir beetle infestation is not confined to national forest lands. Wherever similar stands of state and private owned Douglas-fir timber are adjacent to or intermingled with national forest stands, they too are similarly infested.

3. Control Action to Date

No satisfactory control program has been initiated to date. Sporadic attempts at logging for control have been made but, due to inadequate finances for proper supervision and inadequate road and logging facilities, these have not been very satisfactory. In fact, there is no proven control method developed to date. However, it appears logical to assume that control logging can be successful if timely and properly done.

4. Future Control Needs

Logging aimed at control should be practiced on a limited scale as ideal situations develop. Several such situations usually occur annually where accessibility, market conditions, and other pertinent factors are such as to make control logging feasible if finances for survey, tree spotting, control planning, and supervision of logging operations and slash disposal are available. Such an administrative control program is urgently needed as a stop-gap measure pending the findings of and as an adjunct to an expanded research program.

The following finances are needed to implement such a limited program. Suitable infestation areas are known and available for operating in 1957, provided insect control funds are made available with which to supplement regular timber sale funds to the extent of financing the added control costs.

Survey and field investigations	$ 5,000
Area designation, infested tree spotting and mapping	$ 5,000
Control program planning, supervision and records	$ 5,000
Total	$15,000

V. BLACK-HEADED BUDWORM

1. History of Infestation

Several localized, but very severe, infestations of black-headed budworm have been found in Glacier Park and in the Kaniksu and Kootenai National Forests. The Park infestation covers about 5,000 acres and the national forest about 12,500 acres. This is the first known instance of a possibly serious outbreak of this insect in this region.

2. Damages

This infestation is confined to hemlock thus far and damages are, as yet, minor. Damages can become intolerable if the outbreak persists and is allowed to go uncontrolled. The insect is a heavy defoliator, destroying much of the foliage on the attacked trees in one season. It is understood the pest will also infest true firs and spruce.

3. Control Action to Date

There is apparently no experience in controlling this insect. It is assumed, however, that it can be controlled in the same manner as the spruce budworm. The program proposed here is therefore somewhat in the nature of an administrative study or pilot plant project.

4. Future Control Needs

In view of the severe character of damage inflicted by this pest and the overall damage potential of an extensive infestation, it is desirable to control the national forest outbreak in its infancy. Due to the character of the infestation, which is scattered over eight townships in eight separate small areas, it is estimated that overall control action will cost $2.00 per acre.

Total financial needs	$25,000

VI. MISCELLANEOUS INSECTS

1. History of Infestation

Sporadic outbreaks of mountain pine beetle and Douglas-fir tussock moth continue to require attention. There have been only minor outbreaks of the beetle since 1950 and of the tussock moth since 1947. Currently, there are beetle hotspots on the Clearwater, Gallatin, and Helena National Forests and tussock moth hotspots between Orofino and St. Maries, Idaho; near Polson on Flathead Lake; and in the Colville and Deer Park areas in Northeastern Washington.

Heavy defoliation of larch by several different insects, as yet unidentified, continues over rather extensive areas in Glacier Park, the Flathead and Kootenai National Forests, and adjacent state and private forest lands.

2. Damages

Currently the damages accruing from beetle and tussock moth attack are not heavy. However, the damage potential is serious, particularly from the beetle, if a major outbreak should get out of hand.

Damage of undetermined extent is obviously accruing from larch defoliation. Thus far this damage is believed to be confined to tree growth loss caused by the defoliation. It is quite probable that if defoliation continues over a number of years tree mortality can be expected.

3. Control Action to Date

No major control action has been taken against the pine beetle since 1950 and none against the tussock moth since 1947. Minor control projects involving a few trees or a few acres are continually being undertaken to stay on top of incipient outbreaks of the pine beetle. Both logging and chemical or burning control means are used, depending upon accessibility.

No control action has as yet been undertaken towards the larch defoliators.

4. Future Control Needs

There is a definite need for the administrative control agencies to be constantly on the alert and prepared to prevent incipient outbreaks becoming full-scale, major infestations insofar as possible. In insect control, as in fire control, a few dollars worth of timely prevention or early control action can save many dollars worth of late control action and damages. Also, administrative agencies, particularly the national forests, should be properly financed and in a position to facilitate the work of the Missoula Forest Insect Laboratory organization in meeting over-load conditions and unforeseen emergencies.

It is estimated that in order to adequately meet recurring emergency operational survey and control needs, including facilitating assistance to the Forest Insect Laboratory and financial cooperation with state and private owners wherever involved, the region (FS) should have an annual working fund of $10,000.

VII. PROPOSED 1957 FOREST INSECT PROGRAM AND FINANCIAL SUMMARY

Spruce Budworm. Situation warrants continued action. The 1957 control program should include an estimated 814,170 acres of infestation all in Montana. This acreage is estimated to be 662,267 federal; 12,394 state; 139,509 private ownership.

	Fiscal Year 1957	1958
Total cost at $1.00 per acre. ($738,217 federal; $6,198 state; $69,755 private)	$694,707	$119,463
Engelmann Spruce Beetle. Situation is alleviating gradually. Maintenance and operation surveys, and control logging and salvage should be continued through fiscal year 1958 at a slightly reduced level. Trap tree program can be discontinued. National forest program cost estimated at	0	$125,000
Douglas-fir Beetle. Situation is still serious and warrants close attention. Excellent opportunities are available for several logging-for-control administrative studies in conjunction with regular sales. Estimated cost of insect control phase of special studies	0	$ 15,000
Black-headed Budworm. A new infestation of serious potential has broken out. National forest only - estimated at 12,500 acres. All federal ownership. Estimated control cost at $2.00 per acre	$ 21,000	$ 4,000
Miscellaneous Insects. Emergency funds needed to facilitate emergency surveys of incipient outbreaks by the Forest Insect Laboratory, and to take immediate control action where warranted and feasible	0	$ 10,000
Aerial and ground surveys, compilation of field maps and survey data, other preparatory work necessary in conjunction with submission of 1958 project estimates and recommendations. Work performed jointly by NFA and FIL	0	$ 30,000
Total cost of program not including general insect investigations, research and preliminary surveys by Forest Insect Research organization of Intermountain Forest and Range Experiment Station	$715,707	$303,463

The need for a greater mileage of access roads, as an essential adjunct to insect control, is still acute. Adequate insect control is not practical, economically, until an adequate transportation system has been provided into all major forested areas.